

AP10875

Claims

1-17 Canceled

18. (New) A method for indirect tire pressure monitoring, the method comprising:
- learning test variables (DIAG, SIDE, AXLE), which describe rotational movements of wheels;
- learning at least one torsion natural frequency f_p for at least one tire from oscillation behavior of individual tires;
- determining at least one shift of the torsion natural frequency f_p from at least one actually determined torsion natural frequency and from the at least one learnt torsion natural frequency; and
- combining rolling circumference differences (DIAG, SIDE, AXLE) with the at least one shift of the torsion natural frequency f_p in a joint warning strategy for detecting and warning of tire inflation pressure loss.
19. (New) A method according to claim 18, wherein either of the learning operations is not started until an automatically or manually generated signal (reset).
20. (New) A method according to claim 18, wherein one of the learning operations is executed while the tires heat up or cool down.
21. (New) A method according to claim 20, wherein a complete heating or cooling of the tires is detected from a uniform increase or reduction of the torsion natural frequencies f_p of all tires to an almost constant final value.
22. (New) A method according to claim 20, wherein a change of an outside or ambient

AP10875

temperature is evaluated with respect to the heating or cooling of the tires.

23. (New) A method according to claim 20, wherein a rain sensor is evaluated with respect to the heating or cooling of the tires.
24. (New) A method according to claim 20, wherein a length of a vehicle immobilization time allows obtaining information about a condition of the tires.
25. (New) A method according to claim 18, wherein one of the learning operations is executed in several different speed intervals, or wheel torque intervals, or lateral acceleration intervals.
26. (New) A method according to claim 18, wherein initially only a rough position of the torsion natural frequency f_p is determined in a wide frequency range, such as a frequency range of roughly 20 hertz to roughly 60 hertz, with a coarse frequency resolution, such as a frequency resolution of approximately 1 hertz.
27. (New) A method according to claim 26, wherein subsequently a range is defined around the approximate position of the torsion natural frequency f_p , in which a precise position of the torsion natural frequency f_P is determined with a fine frequency resolution, such as with a frequency resolution of approximately 0.5 hertz.
28. (New) A method according to claim 18, wherein a warning regarding tire inflation pressure loss is issued when at least one rolling circumference difference ($\Delta DIAG$, $\Delta SIDE$, $\Delta AXLE$) or at least one shift of the torsion natural frequency f_P exceeds a previously fixed coarse threshold.

AP10875

29. (New) A method according to claim 18, wherein a warning regarding tire inflation pressure loss is issued when the shifts of the torsion natural frequencies f_P of all wheels exceed a previously fixed fine threshold.
30. (New) A method according to claim 18, wherein a warning regarding tire inflation pressure loss is issued when at least one rolling circumference difference (ΔDIAG , ΔSIDE , ΔAXLE) as well as at least one shift of the torsion natural frequency f_P exceeds previously fixed fine thresholds.
31. (New) A method according to claim 30, wherein a warning regarding tire inflation pressure loss is issued only when the correlation between the rolling circumference differences (ΔDIAG , ΔSIDE , ΔAXLE) and the shifts of the torsion natural frequencies f_P exceeds a predetermined limit value which indicates tire inflation pressure loss with an appropriate likelihood.
32. (New) A method according to claim 18, wherein in a joint warning strategy, the thresholds of the rolling circumference differences (ΔDIAG , ΔSIDE , ΔAXLE) for warning of tire inflation pressure loss are adapted depending on the shift of the torsion natural frequency f_P .
33. (New) A method according to claim 18, wherein in a joint warning strategy, the thresholds of the rolling circumference differences (ΔDIAG , ΔSIDE , ΔAXLE) for warning of tire inflation pressure loss are adapted depending on the shift of the torsion natural frequency f_P and on the correlation between the rolling circumference differences (ΔDIAG , ΔSIDE , ΔAXLE), and on the shifts of the torsion natural frequency f_P .